

STANDARD OPERATING PROCEDURE FOR SAFE HANDLING OF LIQUID NITROGEN

You should be aware of the risks of burns and asphyxiation when working with liquid nitrogen.

DO NOT attempt to handle liquid nitrogen before being trained by experienced colleagues.

Please read and follow the following guidelines – they are important to ensure your safety.

1. Ensure that you have been appropriately trained in the risks involved, in safe operating procedures and first aid procedures in the event of an accident.
2. Two people must be present at all times when dealing with liquid nitrogen.
3. Protective clothing must be worn, including insulating gauntlet gloves, a full-face visor, lab coat (closed), shoes which cover the whole foot. All exposed skin, including legs, should be covered.
4. Always handle and store liquid nitrogen in a well-ventilated area. Prop the door open to the corridor.
5. Only use proprietary insulated containers for holding liquid nitrogen (a dewar flask) with a lid and carrying handle. Treat these containers with care.
6. Pouring liquid nitrogen or immersing items should be done slowly to minimise boil off and splashing.
7. Keep dewars away from flammable solvents and grease.
8. It is forbidden to accompany liquid nitrogen vessels in the lift. You must display a notice forbidding entry prominently, so that people do not enter the lift at intermediate floors. A second person should be waiting at the destination floor to take charge of the vessel.
9. When removing samples from liquid nitrogen, do not remove your face mask until you are sure that all nitrogen has evaporated.

SAFE HANDLING OF LIQUID NITROGEN

Handling of liquid nitrogen is dangerous – it causes burns and asphyxia.

CRYOGENIC BURNS

The low temperatures associated with liquid nitrogen can cause cryogenic burns. Use of protective clothing is an essential safeguard against this.

First Aid for Cryogenic burns

Small burns to the fingers:

- Place in a warm place such as the armpit for speed.

More serious burns:

- Flush the area with tepid water. Do not use a forceful flow of water as this could cause tissue damage.
- Do not apply direct heat.
- Move the casualty to a warm place (approx 22°C) and seek medical attention, or if the burn is severe call an ambulance. **(From a University phone dial 222 or from a brown phone dial R-999)**

While waiting for medical attention/ambulance

- Continue to flush the affected area of the skin with tepid water
- Loosen the casualty's clothing and remove any tight jewellery
- Keep the patient warm and at rest
- Do not allow the patient to smoke and do not offer hot beverages

ASPHYXIA

The release of nitrogen into the atmosphere reduces oxygen levels and causes hypoxia.

Sudden asphyxia: In sudden asphyxia (inhalation of gas containing little or no oxygen) unconsciousness is immediate and death follows quickly, unless action is taken.

Gradual asphyxia: Gradual asphyxia can occur if nitrogen gradually displaces atmospheric oxygen. Unconsciousness and death may follow.

The risk of gradual asphyxiation is particularly acute because the affected individual will not be aware of the development of dangerous levels of hypoxia.

First Aid for asphyxiation

If safe to enter, move the casualty to fresh air. If unconscious, open the airway, check breathing and pulse, call for help and be ready to resuscitate. **(From a University phone dial 222 or from a brown phone dial R-999)**

For your own safety it is essential that liquid nitrogen is stored in an appropriate area and handled in a safe way. IF IN DOUBT – SEEK ADVICE.

All incidents involving liquid nitrogen should be reported.